

APPENDIX. Vascular epiphyte and climber (E-C) species recorded on two or more tree individuals in a 1-ha plot at El Nogalar National Reserve, Salta, Argentina, listed by botanical family, life form, and total and per tree species mean percentage coverage. Bold numbers indicate maximum coverage for each E-C species.

| Epiphyte-climber species | Family | Life form | Total | Aled | Blsa | Celi | Juau | Myps | Popa |
|--|-----------------|-----------|-------|-------------|-------------|-------------|--------------|-------|--------------|
| <i>Asplenium auritum</i> Sw. | Aspleniaceae | E | 0.30 | 0.21 | 0.09 | 0.19 | 0.01 | — | 1.20 |
| <i>Asplenium praemorsum</i> Sw. | Aspleniaceae | E | 0.53 | 0.33 | 0.29 | 0.74 | 0.01 | — | 1.78 |
| <i>Caioophora lateritia</i> (Hook.) Klotzsch | Loasaceae | C | 0.005 | — | — | — | — | 0.01 | 0.02 |
| <i>Campylocentrum grisebachii</i> Cogn. | Orchidaceae | E | 0.04 | 0.04 | 0.03 | 0.04 | 0.03 | — | 0.09 |
| <i>Campyloneurum aglaolepis</i> (Alston) de la Sota | Polypodiaceae | E | 5.34 | 0.83 | 5.93 | 7.03 | 0.59 | 0.57 | 15.04 |
| <i>Cissus tweediana</i> (Baker) Griseb. | Vitaceae | C | 0.02 | — | — | — | — | — | 0.10 |
| <i>Cyclanthera tamnifolia</i> Griseb. | Cucurbitaceae | C | 0.02 | — | 0.02 | 0.01 | 0.01 | 0.005 | 0.07 |
| <i>Dioscorea glandulosa</i> (Griseb.) Kunth | Dioscoreaceae | C | 0.03 | — | 0.01 | 0.03 | — | 0.01 | 0.09 |
| <i>Dryopteris patula</i> (Sw.) Underw. | Dryopteridaceae | E | 0.94 | — | 0.18 | 0.67 | — | 0.01 | 3.98 |
| <i>Macfadyena unguis-cati</i> (L.) A.H. Gentry | Bignoniaceae | C | 5.74 | 0.84 | 4.91 | 4.79 | 10.95 | 0.75 | 6.17 |
| <i>Microgramma squamulosa</i> (Kaulf.) de la Sota | Polypodiaceae | E | 0.97 | 0.57 | 1.40 | 1.46 | 0.18 | 0.90 | 1.44 |
| <i>Pecluma filicula</i> (Kaulf.) M. G. Price | Polypodiaceae | E | 0.10 | — | — | — | — | — | 0.48 |
| <i>Pecluma oranense</i> (de la Sota) de la Sota | Polypodiaceae | E | 2.88 | 1.03 | 2.20 | 2.56 | 0.10 | 0.11 | 10.09 |
| <i>Peperomia lorentzii</i> C. DC. | Piperaceae | E | 2.96 | 5.94 | 4.33 | 2.53 | 1.37 | 2.14 | 4.11 |
| <i>Pleopeltis macrocarpa</i> (Bory ex Willd.) Kaulf. | Polypodiaceae | E | 0.92 | 0.42 | 1.05 | 0.73 | 0.43 | 0.03 | 2.49 |
| <i>Polypodium lasiopus</i> Klotzsch | Polypodiaceae | E | 0.02 | — | — | — | — | — | 0.09 |
| <i>Polypodium tweedianum</i> Hook. | Polypodiaceae | E | 0.02 | — | 0.10 | 0.02 | — | — | — |
| <i>Polytaenium lineatum</i> (Sw.) J.E. Sw. | Vittariaceae | E | 0.11 | — | 0.10 | 0.05 | — | — | 0.40 |
| <i>Rhipsalis floccosa</i> Pfeiff. | Cactaceae | E | 0.05 | — | 0.04 | 0.10 | — | — | 0.14 |
| <i>Senecio epiphyticus</i> Kuntze | Asteraceae | E | 0.92 | 0.76 | 0.92 | 0.63 | 0.07 | 0.45 | 2.66 |
| <i>Tillandsia recurvata</i> (L.) L. | Bromeliaceae | E | 0.02 | — | 0.01 | 0.07 | 0.02 | — | — |
| <i>Tillandsia sphaerocephala</i> Baker | Bromeliaceae | E | 0.39 | — | 0.66 | 0.95 | 0.16 | 0.02 | 0.49 |
| <i>Tillandsia usneoides</i> (L.) L. | Bromeliaceae | E | 0.24 | — | 0.21 | 0.65 | 0.18 | 0.03 | 0.30 |

Note: E = epiphyte. C = climber. Tree abbreviations: Aled = *Allophylus edulis*, Blsa = *Blepharocalyx salicifolius*, Celi = *Cedrela lilloi*, Juau = *Juglans australis*, Myps = *Myrcianthes pseudo-mato*, and Popa = *Podocarpus parlatorei*.

VASCULAR EPIPHYTES IN THE TEMPERATE ZONE— A BIBLIOGRAPHY

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ABSTRACT. Vascular epiphytes typically are associated with tropical rain forests, whereas their occurrence in temperate forests is little appreciated. This bibliography lists nearly 200 citations dealing with the biology of this group at latitudes beyond the tropics of Cancer and Capricorn. Papers on ecology, physiology, anatomy, morphology, and natural history are included, while purely taxonomic accounts are excluded. The bibliography also is available electronically (request to be sent to the author).

RESUMEN. Epífitas vasculares son típicamente asociados con los trópicos, menos apreciado es su presencia en los bosques templados. Esa bibliografía presenta casi 200 citas relacionadas con la biología de este grupo. Se incluye artículos sobre ecología, fisiología, anatomía, morfología y historia natural, pero en general se excluyeron publicaciones puramente taxonómicas o florísticas. Esta bibliografía es disponible en forma electrónica (pedidos al autor).

Key words: accidental epiphytes, biogeography, drought, ferns, frost, temperate forests

INTRODUCTION

This bibliography of the scientific literature on vascular epiphytes that occur beyond the tropics is intended to stimulate research in these poorly studied plants. In spite of the great scientific interest in vascular epiphytes in recent years, this attention is confined geographically almost completely to lower latitudes. When it comes to descriptive epiphyte biogeography outside the tropics, let alone an understanding of the mechanisms responsible for the relative paucity of vascular epiphytes in most temperate areas, we have not progressed much since A.F.W. Schimper published his seminal monograph on epiphytes in 1888.

The steep gradients in the diversity and the abundance of vascular epiphytes from the tropics to higher latitudes have been mentioned by Schimper (1888). He also noted the pronounced asymmetry of this latitudinal trend: the rich epiphyte floras of New Zealand and Chile rival those of many tropical regions (e.g., Hofstede et al. 2001). The most species-rich region in respect to vascular epiphytes in the north-temperate zone is the Himalayas (Schimper 1888), but locally abundant epiphyte populations also occur in temperate East Asia (Kolbeck 1995), Central Europe (Zotz 2002), the British Isles (Tansley 1939), or the Pacific Northwest of North America (Sillett 1999).

The observed latitudinal trend is generally attributed to hypothesized limitations by frost or drought (Schimper 1888, Gentry & Dodson 1987, Benzing 1990). Clearly, these hypotheses are not mutually exclusive. Unfortunately, how-

ever, neither factor alone or in combination has been tested experimentally. Moreover, possible influences of historical events (e.g., Pleistocene extinctions) or other ecological factors (e.g., prevalence of conifers in the northern hemisphere) on the extant global distribution of vascular epiphytes rarely have been put forward, while certainly deserving more attention.

Geographically, this bibliography covers all studies from latitudes beyond the tropics of Cancer and Capricorn. To avoid unnecessary overlap, however, with earlier bibliographies (Watson et al. 1987, Nadkarni & Ferrell-Ingram 1992), studies from subtropical areas such as southern Florida are generally excluded. References are not limited to those focusing on holoepiphytes. Many terrestrial plants grow occasionally on living trees, and in the temperate zone, these “accidental epiphytes” frequently constitute the majority of epiphytically growing tracheophytes. Consequently, reports on accidental epiphytes make up a large proportion of the citations.

The citations compiled here were collected by a thorough search of journals, books, proceedings, and online search engines. All citations have been read by the author. This was particularly important because vascular epiphytes are frequently mentioned in the bryological literature without being indexed in search engines. The same is true for book chapters. Thus, quite a few of the citations do not primarily deal with vascular epiphytes; they focus on non-vascular epiphytes or are (descriptive) vegetation studies with some ecological information on vascular epiphytes. Considering the paucity of informa-

tion on vascular epiphytism in temperate regions it seemed appropriate to include these papers. The author is well aware that in spite of all efforts this bibliography cannot be complete. Thus, he would very much appreciate any information on omissions or corrections.

The citations are listed alphabetically by author. Each reference is indexed to summarize the geographical region of the study, general subject matter, and taxonomic group studied (see APPENDIX). The list is available in three formats: reprint, unformatted ASCII file, and bibliographic database (ENDNOTE, ISI Research Soft, Berkeley, CA, USA). Those interested should contact the author.

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APPENDIX. INDEX OF BIBLIOGRAPHIC CITATIONS

Geographic Areas

Africa, 102.

Australia/Tasmania, 3, 5, 27, 76, 82, 83, 194.

Europe (including Atlantic islands), 8, 9, 11, 13, 15, 16, 17, 18, 19, 24, 25, 31, 47, 48, 55, 57, 59, 62, 63, 69, 75, 79, 80, 81, 86, 87, 88, 90, 97, 99, 103, 104, 115, 120, 122, 124, 133, 148, 151, 152, 153, 154, 157, 158, 159, 160, 163, 175, 176, 179, 181, 182, 184, 185, 186, 187, 188, 191, 195, 197, 198, 199.

Himalaya region, 4, 21, 22, 23, 32, 51, 64, 91, 92, 93, 96, 111, 112, 126, 127, 128, 136, 137, 138, 141, 161, 172, 173, 180, 189, 190.

New Zealand (including Southern Pacific), 6, 10, 12, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 50, 52, 67, 68, 71, 73, 74, 78, 94, 123, 125, 129, 134, 135, 150, 164, 165, 192, 196.

North America, 20, 26, 28, 29, 30, 58, 65, 66, 70, 72, 84, 85, 89, 98, 105, 106, 107, 108, 109, 110, 113, 118, 130, 131, 132, 156, 166, 167, 168, 169, 170, 171, 178.

Temperate East Asia, 77, 95, 101, 114, 174.

Temperate South America, 1, 2, 35, 49, 53, 54, 61, 100, 116, 117, 121, 139, 140, 142, 143, 144, 145, 146, 147, 149, 155, 177, 183.

Subject Areas

Accidental epiphytes, 8, 9, 11, 15, 16, 17, 18, 19, 22, 24, 25, 31, 32, 35, 45, 50, 51, 55, 59, 63, 67, 69, 70, 71, 75, 78, 79, 80, 81, 84, 89, 95, 98, 99, 103, 104, 110, 115, 120, 123, 126, 133, 135, 138, 149, 153, 156, 157, 158, 159, 160, 167, 171, 175, 176, 180, 181, 182, 184, 185, 186, 187, 188, 190, 192, 195, 197, 198, 199.

Biogeography and paleobotany, 2, 7, 11, 14, 21, 23, 38, 42, 44, 45, 46, 52, 53, 58, 60, 73, 83, 91, 97, 111, 112, 113, 123, 129, 134, 136, 137, 149, 152, 162, 173, 190.

Ecology and conservation, 1, 2, 7, 10, 11, 13, 14, 16, 17, 19, 20, 21, 23, 24, 28, 29, 30, 31, 32, 33, 34, 35, 38, 39, 42, 43, 45, 46, 48, 49, 50, 51, 53, 54, 55, 56, 57, 58, 60, 61, 62, 64, 65, 66, 67, 68, 71, 72, 73, 74, 75, 76, 77, 78, 83, 85, 89, 91, 92, 94, 95, 96, 97, 99, 100, 101, 111, 112, 116, 117, 121, 122, 123, 124, 125, 127, 129, 130, 132, 133, 135, 136, 138, 140, 141, 142, 143, 144, 145, 146, 149, 150, 151, 152, 154, 155, 156, 158, 161, 162, 163, 169, 170, 171, 172, 173, 174, 175, 176, 177,

179, 180, 182, 183, 186, 190, 192, 196, 198, 199.

Morphology and anatomy, 20, 37, 40, 116, 123, 131, 177.

Physiology and environment, 1, 4, 7, 14, 20, 55, 65, 72, 86, 87, 88, 105, 106, 107, 108, 109, 118, 123, 131, 132, 145, 147, 166, 172, 177, 178.

Plant-animal interactions, 6, 7, 12, 14, 36, 46, 102.

Vegetation description and analysis (including annotated species lists), 3, 5, 7, 10, 13, 14, 16, 21, 25, 26, 27, 33, 34, 35, 38, 41, 42, 45, 46, 47, 53, 61, 69, 71, 73, 74, 75, 76, 78, 82, 90, 92, 94, 95, 97, 103, 104, 111, 114, 117, 121, 122, 123, 124, 126, 127, 133, 139, 149, 150, 151, 154, 155, 157, 158, 162, 164, 165, 170, 173, 175, 179, 181, 183, 186, 189, 190, 191, 192, 194, 195, 196, 197, 199.

Taxonomic Groups

Bromeliaceae, 2, 14, 20, 29, 30, 45, 46, 53, 58, 60, 65, 72, 105, 106, 107, 108, 109, 113, 117, 121, 130, 155, 162, 166.

Ferns and fern-allies, 1, 2, 3, 7, 8, 9, 10, 11, 13, 14, 16, 21, 23, 24, 25, 26, 27, 28, 30, 31, 32, 33, 34, 35, 38, 41, 44, 45, 46, 47, 48, 50, 51, 52, 53, 55, 56, 57, 60, 61, 62, 64, 66, 67, 71, 73, 74, 75, 76, 78, 82, 83, 85, 86, 87, 88, 89, 90, 91, 92, 93, 95, 97, 98, 99, 100, 101, 110, 111, 113, 116, 117, 118, 121, 122, 123, 124, 127, 128, 129, 131, 132, 133, 135, 136, 137, 138, 139, 140, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 154, 155, 156, 157, 158, 159, 160, 162, 163, 164, 165, 167, 168, 169, 170, 171, 172, 174, 175, 176, 178, 179, 180, 183, 184, 186, 187, 189, 190, 191, 192, 194, 197, 198, 199.

Orchidaceae, 2, 4, 10, 14, 27, 28, 37, 44, 45, 46, 50, 51, 52, 53, 60, 67, 68, 71, 76, 77, 92, 96, 102, 112, 123, 155, 161, 162, 190, 192.

Other plant groups, 6, 8, 9, 11, 12, 14, 15, 16, 17, 18, 19, 22, 24, 31, 32, 33, 34, 35, 36, 38, 41, 44, 45, 46, 49, 50, 52, 53, 54, 59, 63, 67, 69, 70, 71, 75, 78, 79, 80, 81, 82, 84, 92, 94, 95, 99, 103, 104, 110, 115, 120, 121, 123, 126, 135, 138, 139, 149, 153, 157, 158, 159, 160, 167, 169, 170, 171, 175, 176, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 190, 192, 195, 197, 198, 199.